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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,567	09/23/2003	Satoko Ito	NG8775US	3077

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EXAMINER

RAABE, CHRISTOPHER M

ART UNIT PAPER NUMBER

2879

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/668,567

Applicant(s)

ITO, ET AL

Examiner

Christopher M. Raabe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09/23/2003
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

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DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 through 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al. (U.S. Patent 6724133), in view of Weber (U.S. Patent 3753795), and in further view of Kanao (U.S. Patent 6470845).

With regard to claim 1:

Miyashita et al. disclose a spark plug (column 1, line 8) for use in an internal combustion engine, comprising:

a tubular insulator (column 10, line 35 and 3 of Figs 1,2) having an axial hole extending therethrough in an axial direction (column 10, lines 45-47 and 3d of Fig 2);

a center electrode (column 1, lines 37-38 and 2 of Figs 1,2) fitted into the axial hole and having a distal end portion protruding from a distal end of the insulator (column 10, lines 47-48 and t, 2 of Fig 2); and

a single or a plurality of ground electrodes located diametrically outside of the center electrode (column 10, lines 54-56 and 4 of Fig 2) and positionally related to a distal end portion of the insulator and the distal end portion of the center electrode such that at least a portion of spark discharge generated between the ground electrode(s) and the distal end portion of the center electrode includes creeping discharge along a surface of the distal end portion of the insulator (column 12, lines 1-8 and 2, 3, 4, g1 and g2 of Fig 2);

at least the distal end portion the center electrode being configured such that at least a surface of the distal end portion of the center electrode is formed of an Ni alloy which contains Ni as a primary component in an amount 80 wt% or more (column 11, line 41) and Fe and Cr as secondary components in a total amount of 2.5 to 10.0 wt%(column 11, lines 40-44).

Miyashita et al. do not disclose the spark plug above wherein the Ni alloy further contains Al as a secondary component in an amount of 0.2 wt% to 0.8 wt%.

Weber does disclose a spark plug wherein the Ni alloy of the electrode further contains Al as a secondary component in an amount of 0.2 wt% to 0.8 wt% (column 2, lines 27-28).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the Al content of the Ni alloy disclosed in Weber into the spark plug of Miyashita et al., as the stability of the resulting aluminum oxide helps to prevent damage to the interior of the electrode

With regard to claim 2:

Miyashita et al. disclose a spark plug for use in an internal combustion engine, wherein the single ground electrode, or at least one of the plurality of ground electrodes is disposed such that a distal end face (4a of Fig 2) of the ground electrode faces a portion of a circumferential surface of the distal end portion of the center electrode (2b of

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Fig 2) while at least a part of the distal end portion of the insulator intervenes therebetween (column 12, lines 1-8 and g1, g2 of Fig 2).

With regard to claim 3:

Miyashita et al. disclose a spark plug for use in an internal combustion engine, wherein the Ni alloy contains Fe, as a secondary component, in an amount of 1.5 wt% to 5.0 wt% (column 11, lines 40-43).

With regard to claim 4:

Miyashita et al. disclose a spark plug for use in an internal combustion engine, wherein the Ni alloy contains Cr, as a secondary component, in an amount of 1.5 wt% to 5.0 wt% (column 11, lines 40-43).

With regard to claim 5:

Miyashita et al. disclose a spark plug for use in an internal combustion engine, wherein the Ni alloy contains at least any one of Mn, Cu, and Co as a secondary component (column 12, lines 20-22).

With regard to claim 6:

Miyashita et al. disclose a spark plug for use in an internal combustion engine, wherein, when b represents the content (wt%) of Al, and c represents the total of Mn, Cu, and Co contents (wt%), the Ni alloy satisfies $0.3b \leq c \leq 6.0b$ (column 23, lines 22-27 and Materials D, E, F, G of Table 1)

With regard to claim 7:

Miyashita et al. disclose a spark plug for use in an internal combustion engine, wherein the center electrode comprises a core member formed of Cu or a Cu alloy

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(column 11, lines 32-33 and 2m of Fig 2), and a covering member formed of the Ni alloy (column 11 lines 29-36 and 2n of Fig 2) and covering at least a distal end portion of the core member such that a distal end of the core member is located on a proximal side with respect to a distal end face of the center electrode (2m and 2n of Fig 2); and

the Ni alloy contains C as a secondary component in an amount of 0.003 wt% to 0.05 wt% (material B of Table 1).

With regard to claim 8:

Miyashita et al. disclose a spark plug for use in an internal combustion engine, further comprising a metallic shell (column 10, lines 34-35 and 5 of Fig 1) disposed in such a manner as to surround a periphery of the insulator and such that the distal end portion of the insulator protrudes beyond a distal end face of the metallic shell (column 10, lines 34-37)

Miyashita et al. do not disclose a spark plug wherein the metallic shell has an outside diameter of 10.1 mm or less at its distal end.

Kanao does disclose a spark plug wherein the metallic shell has an outside diameter of 10.1 mm or less at its distal end (column 1, lines 58-60 and 2, 2a, 2b of Fig 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to place the size requirements of Kanao on the spark plug of Miyashita et al. in order to keep a space surrounding the combustion chamber of the engine (column 1, lines 15-19 of Kanao)

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents 6239052, 4329174; Japan Patent 02163335.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Raabe whose telephone number is 571-272-8434. The examiner can normally be reached Monday-Friday 7am-3:30pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CR


ASHOK PATEL
PRIMARY EXAMINER